YOSHIMURA, GWEN

From: Andrea Polidori <apolidori@aqmd.gov>
Sent: Thursday, September 19, 2013 8:04 AM
To: YOSHIMURA, GWEN
Subject: RE: Annaual Quality Assurance Assessment report
Attachments: SCAQMD TSA template_pages 5-11.docx

Gwen,

Pages 5-11 of the "SCAQMD TSA template" form are attached.
Let me know if you have any questions.

Thanks again for your patience,

Andrea

From: YOSHIMURA, GWEN [mailto:Yoshimura.Gwen@epa.gov]
Sent: Wednesday, September 18, 2013 5:56 PM
To: Andrea Polidori
Subject: RE: Annaual Quality Assurance Assessment report

Thanks Andrea!

_____
Gwen M. Yoshimura
Air Quality Analysis Office
Environmental Protection Agency, Region 9
Phone: 415.947.4134
Email: yoshimura.gwen@epa.gov

mailing address:
U.S. Environmental Protection Agency
Air Quality Analysis Office (AIR-7)
75 Hawthorne Street
San Francisco, CA 94105

From: Andrea Polidori [mailto:apolidori@aqmd.gov]
Sent: Wednesday, September 18, 2013 3:47 PM
To: YOSHIMURA, GWEN
Subject: Annaual Quality Assurance Assessment report

Gwen,

Attached is a copy of our FY2012-2013 Annual Quality Assurance Assessment report.
I hope you will find it useful in preparation of the upcoming TSA.

Thanks,

Andrea

P.S. On Tuesday morning I realized that the “SCAQMD TSA template” form was missing a description of the PM and air toxics labs. I asked two of the principals to provide me with an updated description of their respective lab activities. I should be able to email you this last form in the next few hours. Thanks for your patience and understanding.

OVERVIEW OF AIR MONITORING PROGRAM

General Program

Federal and California State laws require that clean air standards be met and maintained throughout the Country and the State of California. Authority and responsibility for air quality monitoring has been delegated to SCAQMD by the US EPA pursuant to the Clean Air Act of 1977 and the Clean Air Act Amendments of 1990. The SCAQMD is defined in the California Health and Safety Code, Division 26, Air Resources, Section 40412 as the "Sole and exclusive agent having responsibility for air pollution control within the District." The State defines the geographic extent of the SCAQMD as "portions of Counties of Los Angeles, Orange, Riverside, and San Bernardino included within the area of the South Coast Air Basin, as described in Section 60104 of the Title 17 of the California Administrative Code."

The SCAQMD currently has 40 active monitoring stations for criteria pollutants. The pollutants measured include:

- Carbon Monoxide
- Nitrogen Dioxide
- Sulfur Dioxide
- Lead
- Ozone
- Particulate Matter (PM_{10} and $PM_{2.5}$)

Barry Wallerstein is the SCAQMD's Executive Officer. Matt Miyasato, Deputy Executive Officer, heads the Science & Technology Advancement Division. Philip Fine, Assistant Deputy Executive Officer, leads the Monitoring & Analysis sub-Division, which is the primary organization in Science & Technology Advancement responsible for air monitoring. The Monitoring & Analysis group has three functional areas (branches): Laboratory Services & Source Test Engineering (Rudy Eden, manager), Atmospheric Measurements (Jason Low, manager), and Quality Assurance (Andrea Polidori, manager).

Atmospheric Measurements (Monitoring), Laboratory Services & Source Test Engineering (Laboratory), and Quality Assurance (QA) each have a role in the collection and evaluation of ambient air data as defined by the SCAQMD Quality Management Plan (QMP). The Monitoring group is responsible for most of the ambient air data collection, including sampling and data processing of continuous air monitors. The Laboratory is responsible for preparation of sampling media, analysis of analytical samples from the non-continuous monitors, and processing of data from these samples. Both groups are responsible for implementing routine quality assurance and quality control (QA/QC) procedures. The QA group is responsible for tracking and oversight of training, corrective actions, and data handling. The QA group also implements performance and technical audits and coordinates and participates in the preparation of QA planning documents.

Network Management

The ambient air monitoring network in the SCAQMD currently consists of 40 State/Local Air Monitoring Stations (SLAMS) plus several source oriented lead monitors, special studies and Special Purpose Monitoring (SPM) sites that utilize a variety of air pollutant measuring instruments. The following table summarizes the SLAMS sites in the SCAQMD.

Table 1: Air Monitoring sites in the SCAQMD

Station	O_3	CO	SO_2	NO_2	$PM_{2.5}$ FRM	PM_{10} FRM	$PM_{2.5}$ Cont.	PM_{10} Cont.	TSP
Anaheim	X	X		X	X	X	X	X	
ATSF (Exide)									X
Azusa	X	X		X	X	X			X
Banning	X			X		X	X		
Big Bear					X				
Burbank	X	X	X	X	X	X	X	X	
Closet World (Quemetco)									X
Compton	X	X		X	X				X
Costa Mesa	X	X	X	X					
Crestline	X					X	X		
Fontana	X	X	X	X	X	X			X
Glendora	X	X		X			X	X	
Indio	X				X	X		X	
La Habra	X	X		X					
Lake Elsinore	X	X		X			X	X	
LAXH	X	X	X	X		X			X
Long Beach (North)	X	X	X	X	X	X	X	X	X
Long Beach (Hudson)									
Los Angeles	X	X	X	X	X	X	X	X	X
Mira Loma (Van Buren)	X	X		X	X	X	X	X	
Mission Viejo	X	X			X	X			
Norco						X			
Ontario F.S.					X	X			
Palm Springs	X	X		X	X	X		X	
Pasadena	X	X		X	X				X
Perris	X					X			
Pico Rivera	X	X		X	X				X
Pomona	X	X		X					
Redlands	X					X			

Rehrig (Exide)									X
Reseda	X	X		X	X		X		
Riverside-Magnolia		X		X	X		X	X	X
Rubidoux	X	X	X	X	X	X	X	X	X
San Bernardino	X	X		X	X	X		X	X
Santa Clarita	X	X		X		X	X		
So. Long Beach					X	X	X		X
Temecula							X		
Uddelholm (Trojan)									X
Upland	X	X		X			X	X	X
West L.A.	X	X		X					X

Source: SCAQMD 2013 Air Monitoring Network Plan

SCAQMD also operates several sites for the following SPM projects and source-oriented lead sampling:

- Multiple Air Toxics Exposure Study (MATES) IV
- Pb at Exide: Rehrig in Vernon, and ATSF in City of Commerce
- Pb at Quemetco (Closet World) in City of Industry
- Pb at Trojan Battery (Uddelholm) in Santa Fe Springs

In addition, the SCAQMD operates a network of air toxics stations, including National Air Toxics Trends Stations (NATTS) at the Los Angeles (Main) and Rubidoux sites. This audit addressed air toxics activities that support the NATTS, including both field and laboratory operations. These two sites are also designated as National Core (NCore) multi-pollutant monitoring sites.

The District operates a network of Photochemical Assessment Monitoring Stations (PAMS). The PAMS network consists of seven sites. LAX/Hastings is a Type 1 (upwind, background, and transport) PAMS site; Azusa, Burbank, Los Angeles (Main), and Pico Rivera are Type 2 (maximum precursor emission/central business district) sites; Rubidoux and Santa Clarita are Type 3 (maximum ozone concentration) sites. EPA has approved the SCAQMD's PAMS network, operating schedule and forecasting scheme.

Field Operations

Field operations are performed by the Atmospheric Measurements Division, which is managed by Jason Low. This division is divided into two work groups: Ambient Monitoring and Special Monitoring. Routine ambient monitoring is conducted by the Ambient Monitoring Group. The Special Monitoring Group undertakes special projects and seasonal monitoring as needed. The Ambient Monitoring group is subdivided into Operations, Support, and Data Management sections. Day-to-day monitoring station operations are performed by the Operations section, which is broken into sub-sections. Each sub-section has at least one Senior Air Quality

Instrument Specialist (AQIS) and five AQISs. Repairs and calibrations are performed by AQISs in the Support section.

Laboratory Operations

Analytical laboratories provide support for measurement methods that are either too complex or too sensitive to perform in the field environment. In order to provide these services, the laboratories employ advanced instrumentation and staff with highly specialized training.

For ambient air samples to provide useful information or evidence, laboratory analyses must meet the following basic requirements:

1. The laboratory must maintain a suitable facility for sample receipt, storage, analysis, and reduction and storage of data.
2. The laboratory must have sufficient and appropriate equipment that must be calibrated and maintained frequently.
3. The laboratory must have an adequate number of qualified staff.
4. Analytical procedures must be in accordance with official guidance, EPA methods and accepted practice.
5. Complete and accurate records must be kept.

SCAQMD has a clean, modern, expansive laboratory facility located at its headquarters office in Diamond Bar, California. The laboratory supports many chemical analyses necessary to understand a large complex air basin and its diverse source mix. One of the primary responsibilities of the laboratory is the handling of PM filters, which includes preparation, weighing, tracking and storing of $PM_{2.5}$, PM_{10} and total suspended particle (TSP) filters. In addition to PM responsibilities, the laboratory is also responsible for the analyses of Speciation Trends Network (STN), PAMS, NATTS and special projects samples collected by SCAQMD, including samples collected for the Multiple Air Toxics Exposure Study (MATES) series. The compounds SCAQMD routinely analyzes for include:

- PAMS VOCs (SCAQMD SOP00007: "Standard Operating Procedure for TO-14")
- NATTS VOCs (SCAQMD SOP00008B: "Standard Operating Procedure for TO-15")
- PAMS and NATTS Carbonyls (SCAQMD SOP00006: "Determination of Carbonyl Compounds Using Waters 600E High Pressure Liquid Chromatograph and 996 Photodiode Array Detector")
- STN $PM_{2.5}$ metals by X-ray Fluorescence (XRF) (SCAQMD SOP 00004: "Analysis of $PM_{2.5}$ Filter Samples by Energy dispersive X-Ray Fluorescence spectrometry")
- NATTS PM_{10} metals by Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS) (SCAQMD SOP 00005: "Determination of Metals in Ambient Particulate Matter by Inductively Coupled Plasma - Mass Spectrometry")
- TSP-Pb by ICP-MS (SCAQMD SOP 00005: "Determination of Metals in Ambient Particulate Matter by Inductively Coupled Plasma - Mass Spectrometry")
- NATTS Acrolein (SCAQMD SOP00008B: "Standard Operating Procedure for TO-15")
- NATTS Hexavalent Chromium by ion chromatography (SCAQMD SOP 0046: "Analysis of Hexavalent Chromium in Ambient Air by Ion Chromatography")

- STN $PM_{2.5}$ Anions (SCAQMD SOP 00003 "Analysis of PM2.5 filters for Anions by Ion Chromatography")

There are a number of additional activities the laboratory undertakes to support the collection and analysis of air pollutants. These include canister cleaning and preparation, data validation and sample storage.

Particulate Matter Laboratory (Gravimetric Laboratory)
The SCAQMD possesses a PM dedicated humidity and temperature controlled gravimetric laboratory (weighing room) located south of the main laboratory and reachable by a short hallway. All filter conditioning and weighing takes place in this weighing room. Humidity and temperature for the room are computer controlled, accessed, control charted, and recorded at each weighing session. The temperature and relative humidity meet the requirements contained in the U.S. EPA's Reference Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II, May 2013.

Toxicology Laboratory
SCAQMD toxics analyses such as those performed in support of the NATTS Program are conducted within the main agency laboratory. This approximate 20,000 square foot laboratory has room ventilation meeting a minimum of 6 air changes per hour, with good air distribution and has a slightly negative (a minimum of 100 cubic feet per minute per door) relative to hallways and other non-laboratory areas. Toxics analyses are performed on 6 of 16 benches adjacent to 3 fume hoods within this main laboratory (2 benches each for GCMS, HPLC and GCFID analyses). In addition, a small room containing one PAMS canister cleaning and two NATTS canister cleaning ovens is accessed from the main laboratory via a doorway.

Data and Data Management

Data management includes data collection, the data validation process, and a data management system. Data management at the SCAQMD follows two separate tracks: one for continuous (i.e., non-laboratory) data and one for laboratory data.

SCAQMD has defined procedures for handling data from the time of acquisition to the time it is submitted to EPA's Air Quality System (AQS). The procedures are well known to the principal data providers and reviewers. Responsibility for managing ambient monitoring data is divided between the Atmospheric Measurements Branch operators, data validators, and Senior and Principal AQISs.

The Quality Assurance Manager records and documents activity associated with QA audits and evaluation results to a Quality Assurance Alert Log, AQS Event Flag Summary, and Corrective Action Request Log. These reports are incorporated into the review processes of Atmospheric Measurements and the Laboratory.

SCAQMD has four separate data management and validation processes in place for different data streams reported to AQS. Atmospheric Measurements handles continuous monitoring data

while the laboratory conducts these processes using three data streams: 1) filter-based $PM_{2.5}$; 2) filter-based PM_{10}, TSP, Pb, and non-NAAQS metals; and 3) organic analyses.

Continuous Monitoring for Gaseous Pollutants and Particulates

Continuous analyzer air quality data collected at field stations are stored in SCAQMD data loggers and station computers. Each station is polled minute-by-minute and the data are transmitted to the SCAQMD's central computer database. Electronic chart recorders (Eurotherm Chessels) located at each station serve as a back-up system and provide a supplemental record for data validation. Data may also be transferred manually using various devices, including laptop computers and flash drives.

SCAQMD performs four levels of validation for continuous data. The station data loggers and the FORTRAN-based data system perform automated checks. Also, FORTRAN automatically reviews data completeness and backfills any missing hourly data-points on a monthly basis. FORTRAN is an additional backup data source that can be used if the main data acquisition system (DAS) fails at any point. Field Operation staff review data and recommend flags. Data validators review quality control parameters. Data validators then evaluate data in relation to concurrent, corresponding data sets.

Laboratory Data Systems: Filter-Based $PM_{2.5}$ Particulate Monitoring; Monitoring of Lead and non-NAAQS Metals; and Monitoring of Organic Compounds

The laboratory uses a Promium Element® LIMS Data System, which went operational in January 2010. Data for each analyzed sample is exported into the LIMS database. Laboratory analytic data is combined with field data in the LIMS where it is reviewed by a Senior AQ Chemist who also reviews chain of custody sheets, investigates and flags missing data, investigates and flags data outliers, flags data for exceptional events, and produces quarterly reports and a pipe delimited text document that is submitted to AQS. Sample information is recorded on sample logs, chain of custody sheets, sampler printouts, and sampler digital outputs and transferred to the laboratory LIMS database (SOP00108). The LIMS database also tracks prepared samples, samples deployed to the field, and samples returned and awaiting analysis. PM data is processed, verified and validated according to SOP00121.

Quality Management

Quality management is a system for overseeing quality assurance (QA), quality control (QC) and quality improvement activities. The US EPA requires that ambient air monitoring agencies receiving federal funding have a quality management system that conforms to 40 CFR part 50 Appendix A and EPA's quality policy (EPA Order CIO 2105.0). Additionally, EPA grant regulations require each grantee to provide for QA activities (40 CFR part 31.45). Specifically, 40 CFR part 50 Appendix A, §3 requires that each ambient air monitoring Primary Quality Assurance Organization (PQAO) conforms to certain quality management practices including:

- A documented quality system that meets EPA requirements for Quality Management Plans (QMPs) and Quality Assurance Project Plans (QAPPs).

- A quality management function that is independent of air monitoring operations.
- Defined Data Quality Objectives (DQOs), or equivalent systematic planning procedures, for all monitoring programs.
- Participation in National Performance Evaluation Programs, which consist of performance audits used to independently determine program adequacy, national monitoring network performance, and national consistency.
- Participation in Technical Systems Audits by EPA at a frequency of at least once every three years.
- Use of certified reference materials to standardize monitoring equipment.

EPA views the application of these quality management system components as integral to satisfying federal monitoring program requirements. Insufficient quality management and control may undermine the ability of EPA to make NAAQS designation decisions due to data of insufficient or indeterminate quality for program needs.

The SCAQMD has a well defined quality management system, which includes a quality management plan (QMP) and oversight by an independent quality assurance manager and robust audit program.

The SCAQMD has a QA group (QA Branch) led by a QA Manager, Andrea Polidori, having organizational parity with the Ambient Monitoring and Laboratory Managers. There are two current staff members who report directly to the QA Manager; a QA Senior AQ Instrument Specialist responsible for field auditing and a QA Senior AQ Chemist responsible for laboratory QA activity as well as tracking of M&A documentation. The QA group also manages a support contract to perform additional QA/QC audits of the monitoring network.

EPA regulations require independent performance audits of gaseous pollutants and flow audits of $PM_{2.5}$ and PM_{10} air samplers and monitors. For gaseous pollutants, regulation requires that 25% of each pollutant monitoring network be audited per calendar quarter, thus ensuring that each instrument is audited once per year. Prior to 2007, flow audits of these monitors were also required. Additionally, quarterly independent flow audits of $PM_{2.5}$ samplers were required. Beginning in calendar year 2007, semi-annual flow audits of each $PM_{2.5}$, PM_{10}, and TSP sampler were required (40 CFR, Part 58, Appendix A, Sections 3.2.4 and 3.3.3.). This is in addition to the required monthly flow evaluations as per 40 CFR, Part 58, Appendix A, Sections 3.2.3 and 3.3.2.

The Quality Assurance Branch is responsible for conducting required gaseous pollutant audits as well as PM_{10} and $PM_{2.5}$ flow audits. An independent contractor performs flow audits of filter-based samplers and provides audit results to the QA Branch and site operators. This same contractor also performs meteorological audits.